REMARKS

Reexamination and reconsideration of the rejections are hereby requested.

In one aspect as set forth in claim 1, the invention is a high compression ratio homogeneous charge compression ignition/spark ignition dual mode engine. A first mode employs homogenous charge ignition at low and mid-load levels and a second mode employs spark ignition at high load levels, the second mode including the addition of hydrogen or a hydrogen/carbon monoxide mixture in the engine. As discussed in the specification, when high compression ratios are used, there can be a severe knock problem in the spark ignition engine operating mode. Thus, according to the invention, hydrogen or hydrogen/carbon monoxide is added to enhance knock resistance. Therefore, the benefits of a high compression ratio can be gained in the low-load regime utilizing homogeneous charge compression ignition and in the high-load regime using spark ignition.

Claims 1-10, 12-14, 26 and 27 stand rejected under 33 USC §102(e) as being anticipated by zur Loye *et al.* (6,561,157). Claims 11 and 25 stand rejected under 35 USC §103(a) as being unpatentable over zur Loye *et al.* in view of Daniel *et al.*, (2003/0047147). Although Page 1 of the Office Action indicates that claims 1-27 are rejected, no grounds are specified for the rejection of claims 15-24. Since no statutory grounds for rejection have been set forth, it assumed that claims 15-24 are directed to allowable subject matter. Clarification is requested.

The zur Loye reference is directed a multiple operating mode engine that can involve two different fuels. In one embodiment, zur Loye teaches a transition from a homogeneous charge compression ignition (HCCI) mode to a spark ignition mode. It is important to note that only in the HCCI mode is there a suggestion to use as second fuel such as natural gas or propane in addition to a first fuel such as diesel fuel, kerosene or gasoline. The spark ignition mode utilizes only a single fuel. It is noted that the patent at column 8 at beginning at line 25 suggests that the

technology may be applied to various types of internal combustion engines that combust various fuels including "natural gas, gasoline, propane, hydrogen, diesel, kerosene, naphtha and/or other fuels." The zur Loye patent does not suggest, however, the addition of hydrogen or a hydrogen/carbon monoxide mixture to an engine operating on a different primary fuel at high loads in the spark ignition mode of operation. Nor does the zur Loye patent teach the addition of hydrogen or hydrogen/carbon monoxide mixture at low-to-mid-load levels in a high compression ratio, homogenous charge compression ignition engine operating on a high cetane fuel as set forth in independent claim 17.

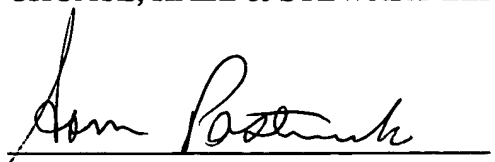
It is also significant that the zur Loye patent does not teach or suggest a change in mode based on engine load as set out explicitly in independent claims 1 and 17. In particular, zur Loye does not teach a homogeneous charge compression ignition mode at low-and-mid-load levels nor employing spark ignition at high load levels with the addition of hydrogen or a hydrogen/carbon monoxide mixture.

Dependent claims 11 and 25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over zur Loye *et al.* in view Daniel *et al.* While Daniel *et al.* certainly discloses a plasmatron reformer, claims 11 and 25 ultimately depend from independent claims 1 and 17 respectively and are therefore allowable as depending from allowable claims as discussed above.

For the foregoing reasons, it is submitted that the pending claims are in condition for allowance and early favorable action is requested.

A petition for a three-month extension of time and payment of extension fee are also enclosed. However, please charge any fees associated with this filing, or apply any credits, to our Deposit Account No. 03-1721.

Respectfully submitted,
CHOATE, HALL & STEWART LLP



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